REMARKS

The objection to claims 18 and 19 is noted with appreciated. Claims 18 and 19 have each been rewritten in independent form to include subject matter similar to and based upon that found in claim 17, and thus both claims 18 and 19 should be in condition for allowance, as should claims 13-16 (claim 13 was amended to depend from claim 18).

A number of the originally filed claims have been cancelled without prejudice or disclaimer. The cancellation of these claims should not be interpreted as an express or an implied admission that the applicants are in agreement with the Examiner's reasons for rejection.

Claim 1 has been amended to further focus the claimed subject matter on clearly novel and allowable aspects of the disclosed subject matter, and a number of new claims 25-61 have been added. Support for these newly added claims can be found in the specification as originally filed.

Claim 1 as now presented is drawn to a method that comprises:

> receiving a wireless communication signal from at least two spatially separated transmit antennas associated with at least one transmitter or from at least two transmitters; and
>
> performing on a corresponding complex composite base band received signal, comprised of real modulation signals, complex modulation signals or a combination of real and complex modulation signals, joint pre-filtering and reduced state sequence detection of real and imaginary parts of signals, from a single receive antenna branch or from a plurality of receive antenna branches, separately to filter out noise plus residual interference across inphase (I) and quadrature (Q) branches.

It is submitted that none of the cited Onggosanusi et al., Arsian et al., Ollson et al. US Patent Publications teach or suggest the claimed subject matter.

The applicants point out that exemplary embodiments of this invention enable the splitting of a

complex baseband signal, including a sum of PAM (real modulation) and QAM (complex modulation) signals, where two copies of the signal are derived. Unlike conventional approaches that may deal with the PAM signal only, in this case the equivalent channel for the PAM signal has a vector form, while the equivalent channel fro the QAM signal has a matrix form (since the real and imaginary parts of the QAM signal form a vector modulation). As a result, even with a single receive antenna one can obtain a MIMO system model (which should not be confused with conventional MIMO systems where signals are treated as basic complex quantities and multiple receive antennas are essential for generating the MIMO model). In accordance with the exemplary embodiments of this invention signal detection may be performed using joint pre-filtering and sequence detection of real and imaginary parts of the modulation signals separately, while filtering out the noise-plus-residual interference across inphase and quadrature branches. The enhanced receiver and method may be implemented using a single receive antenna, unlike traditional MIMO receivers where multiple antennas are needed. The additional of one or more further receive antennas simply enhances the performance.

The Applicants note further that exemplary embodiments of this invention pertain at least in part to several possible cases and scenarios.

A) A base station has at least two antennas that may transmit any combination of GMSK and 8-PSK signaling formats. At the receiver (having one or more receive antennas) I-Q MIMO processing is applied using singe/multiple receiver antennas. If both modulation formats are coming from the same base station the receiver may process both data streams after detection.

B) In another scenario there are multiple base stations that transmit simultaneously causing interference to each other. Each base station has one antenna (even if there are two antennas, one may assume that there is only one modulation signal (GMSK/8PSK) coming from this base station). Now the received signal contains the desired signal (with GMSK/8-PSK) and interference coming from possibly many other base stations whose modulation may be GMSK/8PSK. The receiver (having one or more receive antennas) applies I-Q MIMO detection by estimating the channel impulse response and modulation type parameters from the desired and dominant interfering base stations. The residual interference may be treated as background noise.

In general, the receiver may be configured in at least two modes:

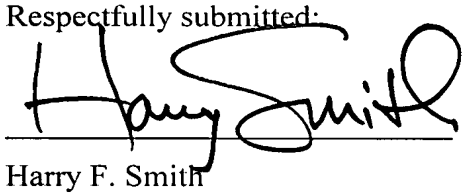
A) Joint I-Q MIMO detection receiver that detects the data of signal and interference but discards the interfering symbols; and

B) Blind I-Q single user detection where the receiver detects the desired signal (e.g. 8-PSK) in I-Q space while treating all interference as background noise.

The amendments made above highlight these and other features of this invention, as do the newly added claims. As but one example, dependent claim 29 is clearly distinguished from a conventional case where feed forward filter weights are complex-valued and filter the complex-valued signals as well.

The Examiner is respectfully requested to reconsider and remove the rejections of the claims and to allow all of the pending claims as now presented for examination. An early notification of the allowability of the pending claims is earnestly solicited.

Respectfully submitted:



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